BODYBOARD STRUCTURE AND THE METHOD FOR MAKING IT

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a bodyboard structure, and more particularly to a bodyboard structure and the method for making it.

2. Description of the Related Art

A conventional surfboard is disclosed in U.S. Patent No. 4,713,032 to Frank. The Frank reference disclosed a surfboard comprising a foam core 8 of EPS or PU, fibrous mates or fibrous fabric 9 wound around the foam core 8, a synthetic resin 10 saturated with the fibrous fabric 9, and a surface layer 6 laminated on the mixture of the fibrous fabric 9 and the synthetic resin 10, thereby forming a finished laminate 12. The mixture of the fibrous fabric 9 and the synthetic resin 10 is stiff and rigid enough, so that the surface layer 6 is not used to protect the foam core 8. However, the surfboard made of the mixture of a reinforced fibrous fabric and a synthetic resin generally has a stiff and rigid structure so that it easily hits and hurts a user when the user falls into the sea during surfing. Therefore, a bodyboard is produced to overcome the drawback of the surfboard.

A conventional bodyboard shown in Figs. 5 and 6 includes a board 20 made of expanded polyethylene, a surface layer 21 made of expanded polyethylene bonded on the top of the board 20, two side layers 22 made of expanded polyethylene bonded on the two sides of the board 20, and a bottom plate 25 bonded on the bottom of the board 20.

In comparison, the bodyboard made of expanded polyethylene(pe) or polypropylene(pp) material usually has a soft and flexible structure, thereby preventing from injuring the user so as to assure the user's safety. Therefore, the bodyboard can be used to overcome the drawback of the surfboard which easily hurts the users. In general, the bodyboard and the surfboard respectively belong to two different fields.

The polyethylene for making the board 20 is expandable at a foaming rate of 20 to 30 times so that there are many "air-cells" 23 contained in the board 20 as shown in Fig. 6 and the air-cells 23 will decide the floating feature of the board 20. The polyethylene for making the surface layer 21 and the side layers 22 is at a foaming rate of 8 to 15 times. Therefore, the air-cells 23 contained in the surface layer 21 and the side layers 22 are smaller than the air-cells 23 contained in the board 20.

Usually, colors or patterns are formed on the surface layer 21 so that the bodyboard presents an aesthetic quality. However, the colors or patterns will quickly fade under the sunshine. In addition, the surface layer 21 cannot be used to protect the board 20 from directly contacting water, dirt or scum, and cannot be used to protect the board 20 made of expanded polyethylene from being corroded by the sea water. Further, the surface layer 21 will be broken under the sunshine or by friction for a period of time. It is known that the ultraviolet rays in the sunshine and seawater will damage the expanded polyethylene. Once the air-cells 23 contained in the surface layer 21 are aged or broken, water will be introduced into the dents formed in the broken air-cells, thereby reducing the floating feature and buoyancy of the bodyboard.

Moreover, the surface layer 21 is used to isolate the board 20 from the surroundings. However, the ultraviolet rays of the sunshine will directly project on the surface layer 21 so that the air-cells 23 contained in the surface layer 21 are easily broken, thereby decreasing the aesthetic quality of the bodyboard, and thereby greatly effecting the lifetime of the bodyboard.

The surface color of the bodyboard is essentially provided by the color of the surface layer 21 which is made by an extruder that is used to produce surface layers 21 of different colors. However, when the color of the surface layer 21 is changed during the manufacturing process, the extruder has to consume an amount of waste material mixed with different colors. Therefore, the manufacturer of making the surface layer 21 often asks the manufacturer of making the bodyboard to buy a great deal of and a determined amount of surface layers with different colors, thereby greatly increasing the costs of fabrication and the amount of stock.

Referring to Figs. 7 and 8, surface layers 211 and 212 are respectively bonded on the top of the board 20 so as to provide different colors or patterns on the top of the board 20. However, an elongated gap or seam 24 will be formed between any two adjacent surface layers 211 and 212. Therefore, two black lines are defined between the surface layers 211 and 212 on the top of the board 20 because dirt and scum are easily retained in the seam 24. Furthermore, the seam 24 easily results in de-lamination of the surface layers 211 and 212.

The closest prior art of which the applicant is aware is disclosed in the applicant's U.S. Patent No. 6,106,345.

Another closest prior art of which the applicant is aware is disclosed in U.S. Patent No. 4,850,913 to Szabad, which disclosed a sports board. With reference to the Szabad reference, a polyethylene film 6 is heat laminated to a polyethylene foam 8 to form a polyethylene film/foam laminate, wherein the polyethylene film 6 forms the outer skin of the board. The polyethylene film/foam laminate is then respectively adhered to the top surface 10, the lower surface 12 and the edges 14 of the foam core 4 by the heat laminated process, thus encasing the foam core 4 with the laminate, thereby forming the board 2.

In the Szabad reference, the board 2 includes a foam core 4, and a laminate laminated on the foam core 4, wherein the laminate includes the polyethylene foam 8 and the polyethylene film 6. In other words, the board 2 includes the foam core 4, the polyethylene foam 8 and the polyethylene film 6. However, the laminate has two layers including the polyethylene foam 8 and the polyethylene film 6. Thus, the laminate has a larger thickness due to the two laminated layers, so that the laminate cannot entirely encompass the outer periphery of the foam core 4. Thus, the laminate having a larger thickness has to in turn adhere to the top surface 10, the lower surface 12 and the edges 14 of the foam core 4 respectively, thereby greatly complicating the manufacturing process, and increasing the cost of fabrication. In addition, the laminate is adhered to the top surface 10, the lower surface 12 and the edges 14 of the foam core 4 respectively. Thus, the laminate is not integrally formed with the foam core 4, so that the laminate is easily stripped from the surface of the foam core 4 during a long-term utilization. Further, the laminate includes the polyethylene foam 8 which is located between the foam core 4 and the

polyethylene film 6, so that when the laminate is heated, the polyethylene film 6 cannot be shrunk to tightly and close encompass the surface of the foam core 4, so that the laminate is easily stripped from the surface of the foam core 4 during a long-term utilization. Further, the laminate can be heated and adhered to the foam core 4. However, the laminate includes the polyethylene foam 8, so that the laminate cannot be heated and compressed. Thus, the laminate is not integrally formed with the foam core 4, so that the laminate cannot efficiently secure the foam core 4, and is easily stripped from the surface of the foam core 4 during a long-term utilization.

SUMMARY OF THE INVENTION

In accordance with a first aspect of the present invention, there is provided a bodyboard structure, comprising:

a base board having multiple outer surfaces; and

a plastic film enclosed around all of the multiple outer surfaces of the base board in a close and seal manner, thereby protecting the entire bodyboard structure.

In accordance with a second aspect of the present invention, there is provided a bodyboard structure, comprising:

a base board having multiple outer surfaces and a bottom face;

a bottom plate mounted on the bottom face of the base board; and

a plastic film enclosed around all of the multiple outer surfaces of the base board in a close and seal manner, thereby protecting the entire bodyboard structure.

Further benefits and advantages of the present invention will become apparent after a careful reading of the detailed description with appropriate reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1A is a perspective view of a base board of a bodyboard structure in accordance with a first embodiment of the present invention;

Fig. 1B is a perspective view of the base board after being cut;

Fig. 1C is a perspective view of a base board and a plastic film of a bodyboard structure in accordance with a first embodiment of the present invention;

Fig. 1D is a perspective view of a bodyboard structure in accordance with a first embodiment of the present invention;

Fig. 2 is a side plan cross-sectional view of the bodyboard structure as shown in Fig. 1D;

Fig. 3A is a perspective view of a base board of a bodyboard structure in accordance with a second embodiment of the present invention;

Fig. 3B is a perspective view of the base board after being cut;

Fig. 3C is a perspective view of a base board and a bottom plate of a bodyboard structure in accordance with a second embodiment of the present invention;

Fig. 3D is a perspective view of a base board, a bottom plate and a plastic film of a bodyboard structure in accordance with a second embodiment of the present invention;

Fig. 3E is a perspective assembly view of the bodyboard structure as shown in Fig. 3D;

Fig. 3F is a perspective view of a bodyboard structure in accordance with a second embodiment of the present invention, wherein part of the plastic film is cut;

Fig. 3G is a perspective view of a bodyboard structure in accordance with a second embodiment of the present invention;

Fig. 4 is a side plan cross-sectional view of the bodyboard structure as shown in Fig. 3G;

Fig. 5 is a flow chart of a conventional bodyboard in accordance with the prior art;

Fig. 6 is a side plan cross-sectional view of a conventional bodyboard in accordance with the prior art;

Fig. 7 is an exploded perspective of another conventional bodyboard in accordance with the prior art; and

Fig. 8 is a side plan cross-sectional view of another conventional bodyboard in accordance with the prior art.

DETAILED DESCRIPTION OF THE INVENTION

Referring to the drawings and initially to Figs. 1 and 2, a method for making a bodyboard structure in accordance with a first embodiment of the present invention comprises the following steps.

In the first step, a base board 10 is provided as shown in Fig. 1A. The base board 10 may be made of a foamable material, such as expanded

polyethylene (PE), PS, polypropylene (PP) or the like. Then, the base board 10 may be cut to have a predetermined shape as shown in Fig. 1B.

In the second step, a plastic film 11 may be wrapped on the base board 10 or the base board 10 may be received in the plastic film 11, so that the plastic film 11 directly and entirely encompasses the outer periphery of the base board 10 as shown in Fig. 1C.

In the third step, the plastic film 11 and the base board 10 may be heated and sealed, so that the plastic film 11 can shrink inward toward the base board 10, to entirely seal the outer periphery of the base board 10, thereby tightly and closely encompassing the outer periphery of the base board 10, and thereby forming a plastic film protection layer around the outer periphery of the base board 10.

In the fourth step, the plastic film 11 and the base board 10 may be heated and compressed, so that the plastic film 11 may be integrally heat bonded on the base board 10 exactly, and so that the outer periphery of the base board 10 may be formed with a serrated surface, thereby forming the bodyboard structure as shown in Fig. 1D, wherein the bodyboard structure includes a base board 10, and a plastic film 11 integrally heat bonded on the outer periphery of the base board 10.

In such a manner, the plastic film 11 having a smaller thickness can directly and entirely encompass the outer periphery of the base board 10 initially. The plastic film 11 and the base board 10 are then heated, so that the plastic film 11 can entirely seal the outer periphery of the base board 10, and the plastic film 11 can shrink inward, thereby tightly and closely encompassing

the outer periphery of the base board 10, and thereby forming a plastic film protection layer around the outer periphery of the base board 10. The plastic film 11 and the base board 10 are then heated and compressed so that the plastic film 11 and the base board 10 are integrally formed with each other, and so that the outer periphery of the base board 10 is formed with a serrated surface.

Thus, when the plastic film 11 is heated, the plastic film 11 can shrink inward to tightly and closely combine with the outer periphery of the base board 10, and when the plastic film 11 and the base board 10 are heated and compressed, they are integrally formed with each other to form an integral secure composite plastic film/board structure. Therefore, the plastic film 11 and the base board 10 are integrally and securely combined with each other, so that the plastic film 11 cannot be stripped from the base board 10 even during a long-term utilization.

In addition, the plastic film 11 entirely encompasses the outer periphery of the base board 10, so that the plastic film 11 together with the base board 10 is initially heated, and is then heated and compressed to form the bodyboard structure, thereby greatly simplifying the manufacturing process, and decreasing the cost of fabrication.

Thus, the above-mentioned method may be used for making a bodyboard structure in accordance with a first embodiment of the present invention.

As shown in Figs. 1D and 2, the bodyboard structure in accordance with a first embodiment of the present invention includes a base board 10

having multiple outer surfaces, and a plastic film 11 enclosed around all of the multiple outer surfaces of the base board 10 in a close and seal manner as shown in Fig. 2, thereby protecting the entire bodyboard structure. Preferably, the plastic film 11 is integrally heat bonded or heat-laminated on all of the multiple outer surfaces of the base board 10 in a close and seal manner.

The plastic film 11 is preferably added with ultraviolet inhibitor and anti-oxidant so as to prevent the ultraviolet rays of the sunshine from directly projecting on the base board 10 made of a foamable material, thereby protecting the base board 10. The plastic film 11 has a thickness preferably ranged between 0.01 mm and 0.1 mm so as to protect the base board 10 from directly contacting water, dirt, and scum, and to protect the base board 10 from being directly projected by the ultraviolet of sunshine. The plastic film 11 may have colors, patterns or the like formed thereon.

In general, as shown in Fig. 2, the base board 10 is made of a foamable material such as expanded polyethylene (PE) that contains many "air-cells" therein which decide the floating feature of the base board 10. The air-cells will be broken under the sunshine during a long period of time, and may be broken due to continuous friction during long-term utilization. In addition, the ultraviolet rays will damage the air-cells of the expanded polyethylene. Once the air-cells contained in the base board 10 are broken, water will be introduced into the broken air-cells, thereby greatly reducing the floating feature and buoyancy of the base board 10 of the bodyboard structure.

The plastic film 11 entirely sealing the outer surfaces of the base board 10 can be used to protect the base board 10 from directly contacting

water, dirt or scum, and can be used to protect the base board 10 from being corroded by sea water or being damaged due to continuous friction. The plastic film 11 can also be used to prevent water from infiltrating into the base board 10, thereby maintaining the floating feature and buoyancy of the base board 10. In addition, the plastic film 11 containing ultraviolet inhibitor and anti-oxidant can be used to isolate the base board 10 from the ambient surroundings so as to prevent the ultraviolet rays of the sunshine from directly projecting on the outer surfaces of the base board 10, thereby preventing the air-cells of the base board 10 from being broken, and thereby protecting the base board 10.

Further, the plastic film 11 has colors or patterns formed thereon. Thus, the manufacturer of making the bodyboard can decide the colors and amounts of the plastic films 11 so that he will not be limited by producers who makes the surface layer of different colors or patterns of the conventional bodyboard, thereby saving cost of production. More important, the plastic film 11 is thin, thereby saving the space of stock. In addition, the plastic film 11 is easily obtained so that the bodyboard structure can be easily fabricated without limit of amount.

Referring to Figs. 3 and 4, a method for making a bodyboard structure in accordance with a second embodiment of the present invention comprises the following steps.

In the first step, a base board 10a is provided as shown in Fig. 3A. The base board 10a may be made of a foamable material, such as expanded polyethylene (PE), PS, polypropylene (PP) or the like. Then, the base board 10a may be cut to have a predetermined shape as shown in Fig. 3B.

In the second step, a bottom plate 12 having a greater stiffness may be bonded on the bottom face of the base board 10a as shown in Fig. 3C.

In the third step, a plastic film 11a may be wrapped on the base board 10a and the base plate 12 or the base board 10a and the base plate 12 may be received in the plastic film 11a, so that the plastic film 11a directly and entirely encompasses the outer periphery of the base board 10a and the base plate 12 as shown in Fig. 3D.

In the fourth step, the plastic film 11a and the base board 10a may be heated and sealed, so that the plastic film 11a can shrink inward toward the base board 10a, to entirely seal the outer periphery of the base board 10a, thereby tightly and closely encompassing the outer periphery of the base board 10a, and thereby forming a plastic film protection layer around the outer periphery of the base board 10a.

In the fifth step, the plastic film 11a and the base board 10a may be heated and compressed except the base plate 12, so that the plastic film 11a may be integrally heat bonded on the base board 10a exactly, and so that the outer periphery of the base board 10a may be formed with a serrated surface except the base plate 12 as shown in Fig. 3E.

In the sixth step, the plastic film 11b mounted on the base plate 12 may be cut out as shown in Fig. 3F, thereby forming the bodyboard structure as shown in Fig. 3G, wherein the bodyboard structure includes a base board 10a, a bottom plate 12 bonded on the bottom face of the base board 10a, and a plastic film 11a integrally heat bonded on the outer periphery of the base board 10a except the bottom plate 12.

Thus, the above-mentioned method may be used for making a bodyboard structure in accordance with a second embodiment of the present invention.

As shown in Figs. 3G and 4, the bodyboard structure in accordance with a second embodiment of the present invention includes a base board 10a having multiple outer surfaces and a bottom face, a bottom plate 12 mounted on the bottom face of the base board 10a, and a plastic film 11a enclosed around all of the multiple outer surfaces of the base board 10a in a close and seal manner as shown in Fig. 4, thereby protecting the entire bodyboard structure. Preferably, the plastic film 11a is integrally heat bonded or heat-laminated on all of the multiple outer surfaces of the base board 10a in a close and seal manner.

Although the invention has been explained in relation to its preferred embodiment as mentioned above, it is to be understood that many other possible modifications and variations can be made without departing from the scope of the present invention. It is, therefore, contemplated that the appended claim or claims will cover such modifications and variations that fall within the true scope of the invention.